

## Moisture Exposure Recommendations for Wood Structural Panels

Wood structural panels such as plywood and oriented strand board (OSB) are predominantly manufactured with Exposure 1 and Exterior bond classifications. Bond classification relates to the strength of the glue bond when wet and **does not** relate to fungal decay, insect or water penetration resistance of the panel. APA recommendations take into account bond classification as well as other panel compositional factors that may affect bond or panel performance. Therefore, only Exterior panels are recommended when long-term exposure to the weather is required. Exposure 1 panels are permitted, however, where temporary exposure, such as during construction, may be expected prior to providing protection that leads to a dry end-use condition.

APA has prepared the following table to provide guidance regarding moisture content and recommended bond classification.

**Table 1. Panel Bond Classification and Use Recommendations**

In-Service Moisture Content	End-Use Conditions	Bond Classification	Design Moisture Conditions	Strength Reduction	Pressure Preservative Treatment
Less than 16%	Dry uses	Exposure 1 or Exterior	Dry	No	No
16% to 19%	Humid interior or protected uses	Exposure 1 or Exterior	Wet	Yes	No
Greater than 19%	Long-term exposure to weather	Exterior <sup>(a)</sup>	Wet	Yes <sup>(b)</sup>	Yes <sup>(b)</sup>
	Other very humid or wet uses	Exterior	Wet	Yes	Yes
	Ground contact	Exterior <sup>(c)</sup>	Wet	Yes	Yes

(a) Panel bond classification is permitted to be Exposure 1 when exposure to weather is on the underside, such as open soffits at roof overhangs. Appearance characteristics of the panel grade should be considered. Use panels with an Exterior bond classification for closed soffits.

(b) Strength reduction and pressure preservative treatment are not required when intermittent drying is provided, such as with siding.

(c) Plywood bond classification is permitted to be Exposure 1 when panels are to be preservative treated for permanent wood foundation.

By far, most wood structural panels are used in interior or dry-use moisture conditions, where in-service moisture content will be less than 16 percent over the service life<sup>(1)</sup>. Occasionally, however, an application will subject panels to higher moisture conditions, such as when located in an area where relative humidity is 90 percent or more for long periods of time. Exposure 1 or Exterior panels are subject to strength reductions for engineered design when in-service moisture content will be 16 percent or greater. Such reductions in capacity are taken as 25 percent for strength and 15 percent for stiffness.

The potential for decay exists when wood products exceed and maintain a moisture content of greater than 19 percent. Therefore, when in-service moisture content will exceed 19 percent, pressure preservative treatment to prevent decay is recommended for panel products in addition to Exterior bond classification. Such provisions also apply when panels are subject to long-term direct exposure to weather, except that if panels have an opportunity to dry intermittently such as with siding applications, the preservative treatment is typically not required.

See APA publications for specific recommendations.

#### FOOTNOTE:

(1) In North America the typical in-service equilibrium moisture content is in the 8 to 12 percent range for wood structural panels.

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